

What is claimed is:

1. An antenna device for use in a wireless communication apparatus, comprising:

a base member which is composed of a dielectric material and which has a peripheral surface and a plain surface;

5 a first antenna element which is formed on said peripheral surface of said base member with said first antenna element having a three-dimensional configuration; and

a second antenna element which is formed on either said peripheral surface or said plain surface of said base member with a predetermined distance being kept from said first antenna element, said second antenna
10 element having a three-dimensional configuration when formed on said peripheral surface, said second antenna element having a two-dimensional configuration when formed on said plain surface.

2. An antenna device as claimed in claim 1, wherein said three-dimensional configuration is a circular cone-shaped configuration.

3. An antenna device as claimed in claim 1, wherein said three-dimensional configuration is a pyramid-shaped configuration.

4. An antenna device as claimed in claim 1, wherein said three-dimensional configuration is a pole-shaped configuration.

5. An antenna device as claimed in claim 1, wherein said three-dimensional configuration is a tube-shaped configuration.

6. An antenna device as claimed in claim 1, wherein said two-dimensional configuration is a plane-shaped configuration.

7. An antenna device as claimed in claim 1, wherein said first antenna element is formed on an inner peripheral surface of said base member.

8. An antenna device as claimed in claim 1, wherein said second antenna element is formed on an inner peripheral surface of said base member.

9. An antenna device as claimed in claim 1, wherein said first antenna element and said second antenna element are formed with respective rotation central axes thereof being corresponding with each other.

10. An antenna device as claimed in claim 1, further comprising a third antenna element which is formed on said base member with a predetermined distance being kept with respect to said first and said second antenna elements.

5

11. A wireless communication apparatus in which said antenna device as claimed in claim 1 is used, wherein a signal from a signal source is supplied to said first antenna element while a ground voltage is supplied to said second antenna element.

5

12. A wireless communication apparatus in which said antenna device as claimed in claim 1 is used, wherein a signal from a signal source is supplied to said second antenna element while a ground voltage is supplied to said first antenna element.

5

13. A wireless communication apparatus in which said antenna device as

claimed in claim 10 is used, wherein a signal from a signal source is supplied to said first antenna element while a ground voltage is supplied to said second antenna element, and wherein said third antenna element is a parasitic antenna.

14. A wireless communication apparatus in which said antenna device as claimed in claim 10 is used, wherein a signal from a signal source is supplied to said second antenna element while a ground voltage is supplied to said first antenna element, and wherein said third antenna element is a parasitic antenna.